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Disease Control Calendar for a Beef Herd

The control of disease and preventing of death loss are important aspects of the management of beef cow herds. In the following discussion of diseases affecting beef cattle, a specific agent or factor is given as the cause of the disease. It must be realized that the agent may not be solely responsible for the presence of the disease. Disease is often the result of the interaction of an agent with other factors such as environment, nutrition, genetics, or combinations of these factors.

January and February

During the winter months in western Canada, the energy requirements of beef cattle increase by 15 to 65 per cent depending on the body condition of the animals and the availability of shelter. The herd should be divided into four groups consisting of replacement heifers, bred heifers, bred cows and bulls. Each of these groups can then be fed rations which are balanced for the energy, protein, mineral, and vitamin requirements specific for that group of cattle. The groups should be monitored to ensure that the targets for body condition and growth are obtained. For example, those cows in average body condition should be gaining 100 to 150 lb (45 to 68 kg) from weaning to calving. Bred heifers should weigh 900 - 1000 lb (400 to 450 kg) at calving, depending on the breed. Replacement heifers must gain about 1.5 lb (0.7 kg) per day after weaning in order to weigh between 650 and 750 lb (295 to 340 kg) at breeding time.

Provision of adequate fresh water, and windbreaks for shelter and control of lice are important. Watch the bred animals for signs of abortion which can be caused by IBR, BVD, and vibriosis. Common feedlot diseases seen in the winter months are ITEME, coccidiosis and waterbelly.

IBR and BVD are viral diseases which usually cause signs of respiratory disease or diarrhea but occasionally can cause abortions in pregnant animals. There is no treatment for either disease but they can be controlled with the appropriate vaccination procedures.

VIBRIOSIS is a venereal disease of cattle caused by the bacterium *Campylobacter fetus*. It is most likely to occur with natural breeding but can occur in an AI program with contaminated semen or infected teaser or clean-up bulls.

Signs vary but repeat breeding is the most common problem associated with vibriosis and can result in long or irregular estrus cycles. A varying period of infertility causes a poor conception rate, lowered pregnancy rates and a prolonged calving season. Bulls may lose weight and sexual interest from being overworked. Abortions can occur at any stage of pregnancy but are most frequently seen from 4 to 7 months of gestation. A 90 day sexual rest enables females to acquire an immunity to the disease. Artificial insemination and/or annual vaccination will keep the disease under control.

COCCIDIOSIS is indicated by blood-stained rear ends, straining and bloody diarrhea. It is an infection of the lower intestine with microscopic parasites called coccidia. Oocysts (eggs) are passed in the feces which may contaminate the feed and water ingested by other animals and cause them to become infected. The disease usually affects feedlot animals or young calves on poorly drained pastures. It often occurs following the stress of another disease or following a prolonged period of cold weather. In an uncommon form of the disease convulsions occur with or without diarrhea.

Sulfamethazine or amprolium by mouth are standard treatments. Monensin, amprolium or sulfa drugs in the feed may help to control the disease. Avoid overcrowding of animals and fecal contamination of feed and water supplies.

URINARY CALCULI (waterbelly) are formed by the crystallization of mineral salts in the urine. Small stones or calculi form in the urine which block the passage of urine through the penis in male animals. Feeds high in silicates or with a low Ca:P ratio are most commonly associated with waterbelly. Vitamin A deficiency may contribute to the condition.

Stretching or shaking of the hind feet, tail switching and straining while urinating are signs of waterbelly. Complete obstruction of urine flow results in rupture of the bladder or the urethra in the penis. The former causes urine to collect in the abdomen and may be confused with bloat. Rupture of the urethra in the penis results in a large swelling under the skin of the lower belly because the urine collects there.

Medication to relax the urethral muscles and allow the passage of the stone may be helpful in early cases but the majority of animals require surgery. Late castra-

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tion, adequate Vitamin A levels (30,000 IU/day), a Ca:P ratio of 1:1 to 2:1 and keeping calves intended for feedlots off pastures of known high silicate content are preventative measures. Adequate water supplies and feeding high dietary levels of salt (3-5 per cent total dry matter intake) are also known to reduce the number of animals with waterbelly.

ITEME (infectious thromboembolic meningoencephalitis) is the infectious nervous syndrome caused by the organism *Hemophilus somnus* and is thought to be carried by mature cows and spread through the respiratory secretions. It is also commonly isolated from the prepuce of feedlot steers.

Several syndromes are recognized as being caused by *H. somnus* but the most common are the respiratory, nervous and joint lameness. The nervous syndrome is common and usually affects feedlot animals from 6 to 10 months of age during midwinter. Fever, stiffness and unsteady gait, with or without blindness, is followed by paralysis and death, often within hours. Early treatment with antibiotics will save many animals. Antibiotics in the feed for a short period of time may be justified if more than one or two cases occur.

A respiratory form of the disease is being recognized with increased frequency and is characterized by signs of a high fever, pneumonia and rapid death. Many animals die before being noticed as ill.

Vaccines are available to aid in controlling *Hemophilus somnus* but they don't appear to be effective in all situations. It appears that a booster vaccination is required to maximize protection.

March and April

This is one of the critical seasons in a cow-calf operation. Calves will be born shortly and preparations for handling the herd prior to, during, and immediately after calving should be completed early. The calving area should be empty, clean and as dry as possible. Snow shouid be removed to provide areas that will be dry as soon as possible when spring arrives.

If coliform diarrhea has been a problem in previous years, vaccines are available which should be administered to all pregnant animals. The immunization procedure recommended requires two injections in the first year of use (and subsequently in first-calf heifers) with one booster injection in following years administered at least three weeks prior to calving. The use of these vaccines will *not* replace good calving management. They are a tool to help in the prevention of scours caused by *E. coli.*

In order to maintain body condition, the amount of energy in the ration should be increased in the weeks prior to calving. This can be accomplished by feeding an average quality roughage in larger amounts or supplementing poor quality roughages with around two pounds of grain per head per day. Restricting feed to pregnant animals in the last trimester will reduce the birth weight of the calves slightly, however, the incidence of dystocia will increase slightly. In addition, restricting feed results in weaker calves with an increased incidence of scours, increased mortality from scours and decreased weaning weights. As well, estrus is delayed in cows with an energy-restricted diet prepartum resulting in a significantly reduced pregnancy rate.

Check the breeding and pregnancy examination records to confirm expected calving dates and make sure heat lamps, stomach tubes and other equipment required at calving are available and ready to use. Consult your veterinarian for advice on the prevention and treatment of calving related problems. Prior to calving, watch for prolapsed vaginas. Grass tetany may be seen at this time of year.

PROLAPSED VAGINA is a condition in cows where the hind part of the genital passage protrudes from the body through the vulva. It usually occurs two to three weeks before calving but occasionally happens at other times. The exposed vagina becomes dirty and sore, causing the cow to strain and make the condition worse.

The vagina should be replaced and retained with sutures and the animal observed closely until calving when the sutures will have to be removed. Such animals should be culled in the fall as this condition is likely to recur annually and there appears to be an inherited susceptibility.

GRASS TETANY is a disease most prevalent in late winter or early spring. It is associated with lowered levels of magnesium in the blood stream. Rather than a simple deficiency of magnesium in the diet, various factors may be interfering with the absorption and metabolism of magnesium e.g., high levels of potassium or nitrogen in the feed. Calcium, phosphorus and sodium as well as energy intake may also be involved.

The disease often appears when animals are put out on a lush pasture which has been heavily fertilized with potash and/or nitrogen. Cows close to calving or nursing a young calf are usually affected. They become nervous, unusually alert, often belligerent, develop a staggering gait with muscle twitching and finally become recumbent. Affected animals are often found down with their head back and legs paddling.

Animals treated early usually respond well to intravenous magnesium and calcium gluconate solutions but animals treated in the late stages of the disease often respond temporarily with an incomplete recovery.

Grass tetany may be controlled by providing a magnesium supplement such as magnesium oxide at the rate of 60 grams per head per day. Shelter should be provided in inclement weather and care taken to see that the ration provides an adequate energy level.

CALVING should take place in as *large* an area as possible if not on open range, with ample clean, dry

bedding. Avoid crowding and wintering animals in the same area as calving is to take place. Provide a place where calves can rest. Watch for cows with retained placentas and uterine infections. Check for mastitis, and especially in first-calf heifers, lack of milk or blind teats. During calving time, check the herd frequently to prevent calves from being born weak or dead. Research indicates that if the cervix is completely dilated, early intervention (help) in the calving process results in a significantly increased number of animals cycling at the beginning of the subsequent breeding season. The pregnancy rate is also improved. Watch for early signs of calf scours and pneumonia.

RETAINED PLACENTA is defined as the failure of the uterus to expel the fetal membranes within 12 to 24 hours after calving. It may be associated with many factors including dystocia, deficiencies of vitamins or minerals e.g., vitamins A and E, selenium, or a Ca:P imbalance. Manual removal of the membranes is not recommended in most situations because of the risk of causing hemorrhage and infection resulting in reduced fertility. If the cow becomes ill, antibiotics by injection are the best therapy in most cases. All animals having a retained placenta should be examined by a veterinarian prior to the start of the breeding season to ensure that the uterus is ready for a new pregnancy.

Calves are susceptible to many diseases and may suffer from two or three diseases at one time. Control of these diseases involves many factors such as nutrition, genetics and environmental stress. The single most important factor in the control of calf disease is the ingestion by the calf of adequate amounts of high quality colostrum (first milk) within 2 to 3 hours of birth. Calves should obtain at least 5 per cent of their body weight of colostrum within the first 2 hours of birth and another 5 per cent within the next 8 to 10 hours of life. Colostrum contains not only essential food nutrients, but also antibodies which help protect the calf against infectious diseases. The most common diseases of young calves are scours, navel infection, pneumonia and white muscle disease.

CALF SCOURS or diarrhea in young calves is a result of bacteria, viruses or protozoa in combination with other factors such as nutritional deficiencies or environmental stresses. Environmental stresses include inclement weather or wet and dirty maternity or calf areas. Most calves are affected in the first two weeks of life and a heifer's calf is more susceptible than a cow's calf.

Because of the diarrhea, the calf becomes dehydrated, manifested most dramatically by sunken eyeballs. It becomes weak and depressed and death may occur in a few hours or after several days. Successful treatment and control of a scours outbreak demands a comprehensive investigation of the symptoms, history, nutritional and environmental factors. Early treatment is essential. Be guided by the recommendations of your veterinarian on the use of antibiotics and other medications. Give electrolyte fluids as soon as a calf starts to scour and continue till scouring stops. Two litres should be given every 6-8 hours to replace lost body fluids. Calves that cannot sit up without support usually require intravenous fluids and the attention of a veterinarian. Keep calves clean and warm with plenty of bedding. Blankets, sacks or heat lamps may be necessary.

Control measures include the avoidance of overcrowding and prolonged confinement of cattle especially in the calving area. Calve cows and heifers separately, preferably with heifers calving a month before the cows. Minimize stress in newborn calves and provide extra care for weak calves. A weak calf which develops scours could start an outbreak, because it may discharge large numbers of organisms during and for a long period of time after it has recovered from scours. Vaccines are available to assist in controlling scours but are only effective if management is optimal. Your veterinarian is in the best position to make recommendations for your herd.

NAVEL INFECTION results from infectious organisms gaining entrance to the navel before it heals after birth. Affected calves have a fever, are depressed and not nursing, and their navel is swollen and painful. The infection may spread throughout the body and cause swollen joints and other complications.

Treatment requires cleaning and disinfecting the navel and the administration of antibiotics. Clean calving grounds are essential to preventing navel-ill and disinfection of the navel at birth with tincture of iodine may also help.

PNEUMONIA is caused by several types of viruses and bacteria but often the infection is secondary to other factors such as chilling, overcrowding, parasitism and other diseases such as calf scours. Several studies have shown an association between inadequate ingestion of colostrum at birth and the incidence of pneumonia at 4 to 8 weeks of age.

One or several calves may be affected. There may or may not be a high fever. Calves may be listless and refuse to nurse, have a short hacking cough especially after exercise, and have difficulty breathing as the disease progresses. Death may occur in a few days and mortality may be high in untreated calves. Some calves may appear to recover, but remain unthrifty for a prolonged period because of damaged lung tissue.

Antibiotics, good nursing care and removal of stress factors are the usual recommended treatments.

NECROTIC STOMATITIS AND LARYNGITIS (calf diphtheria) are caused by one of the two bacteria that cause footrot. In stomatitis, there are white sores on the tongue and insides of the cheeks. Calves drool saliva and their cheeks often bulge with straw or hay. The

mouth has a foul smell. Affected calves are unable to nurse and lose condition quickly. Cleaning the mouth and swabbing the sores with tincture of iodine as well as antibiotic injections usually results in complete recovery.

Lesions of necrotic laryngitis are confined to the voice box and are characterized by loud wheezing breathing which progresses to difficult breathing and loss of condition. Response to early antibiotic treatment may be dramatic, but relapses accompanied by slow overall recovery are common. In severe cases, surgery is required to allow the calf to breathe. Antibiotic therapy should be continued for seven days to minimize the likelihood of recurrence.

WHITE MUSCLE DISEASE is caused by a deficiency of Vitamin E and/or selenium. It appears most commonly in areas where the soil is deficient in selenium, particularly grey-wooded soils. Vitamin E deficiency is often seen when the ration consists mainly of poor hay and straw or ensiled forages. Green hay and grain are good sources of Vitamin E.

Signs of the disease relate to the function of heart or skeletal muscles. Affected calves may be weak, tire easily or die suddenly after exercise. Muscles may be hard and swollen and there may be knuckling or trembling of the limbs. Difficulty in swallowing is sometimes an early sign.

The condition usually responds well to injectable or oral treatment with vitamin E and selenium. Feed a selenium/vitamin E supplement or avoid rations that predispose the animal to white muscle disease. Injections of vitamin E and selenium to newborn calves will help control the disease.

May

Vaccinate calves and yearling heifers against blackleg and castrate and dehorn calves. Implant calves not intended for replacements with growth promotants. Watch for grass tetany. If breeding females require IBR, BVD or vibrio vaccination, they should be done at least 30 days before breeding. Bulls should be evaluated for semen quality and given a complete physical examination, attention being paid especially to potential foot problems. Start watching the breeding herd for signs of estrus. Animals that had reproductive problems during or following calving should be examined and included in the breeding herd only when they have been given a clean bill of health.

June and July

Plan a short breeding season to obtain a short calving season. A limited breeding season is one of the most effective tools for weaning as close to one calf per cow exposed to breeding as possible. Short breeding and calving seasons lead to more efficient use of labor since calving is the period of maximum labor input. A short calving season reduces death losses because it encourages close observation of the herd. In addition, the calves are grouped to reach market weight at the same time. Finally, the herd nutritional plan will be coordinated since all breeding females will have similar nutritional needs at the same time. Breeding seasons of eight weeks are long enough to settle the cows in a well managed herd and many producers are using a six-week season. Future reproductive performance can be improved by breeding more heifers than necessary for replacement, breeding them earlier than the main cow herd and selecting only the heifers bred early for addition to the herd. In some herds, the use of synchronization techniques to concentrate the breeding season is a management tool worth considering.

Ensure adequate bull power: yearling bulls, 1-15 cows; 2-year olds, 1-20 cows; and mature bulls, 1-25 or 30 cows; making allowances for the condition of the animals and the terrain. Ride often to check for bulls fighting and in hilly country to see that the bulls are with all the cows. Check often to see that the bull is breeding your cows and not your neighbors' or he may not only become overworked, but may bring back a disease such as vibriosis. Watch for bulls with a broken penis, evidenced by a large swelling under the belly between the prepuce and scrotum.

Ensure adequate mineral supplementation and avoid overgrazing of the pasture. Diseases which are common at this time of the year are blackleg and footrot.

BLACKLEG is caused by the soil borne bacterium *Clostridium chauveii* which enters the body via the digestive tract and produces localized inflammation of muscles and severe toxemia. It usually affects young animals from 6 months to 2 years of age although other age groups can also be susceptible. Blackleg often occurs in outbreaks with affected animals found dead but occasionally very lame sick animals are noticed with swelling and gas accumulation in affected muscles. These animals are very depressed and may have a fever.

Treatment is seldom successful but large doses of penicillin may be of value if the animal is treated very early in the course of the disease. The disease is controlled by vaccinating the calves in the spring after 2 months of age, followed by a second vaccination in the fall. Dead animals should be disposed of by burning or deep burial.

MALIGNANT EDEMA is caused by several bacteria similar to the one that causes blackleg, and affects cattle of all ages. It is characterized by a watery, usually foul-smelling wound infection which may contain gas. Often there is a large soft swelling under the skin. Fever and depression usually precede death, which often occurs in 24 to 48 hours.

The causative organisms usually gain entry to the body through puncture or surgical wounds (e.g., castra-

tion or dehorning).

Treatment and control are the same as for blackleg and the vaccine used gives immunity to both diseases, hence the term "two-way" Blackleg vaccine. Vaccination should be done at least two weeks before any surgery is performed.

FOOTROT affects cattle all year round but is more frequent under wet and muddy conditions. Two soil-borne organisms are thought to act together to cause footrot. They invade cuts and scratches of the skin of the foot causing a swelling with a foul-smelling discharge at the top of the hoof resulting in a sudden marked lameness.

This condition responds well to antibiotic therapy but later stages of the condition may require washing the foot and scraping away the dead material. Prevention is aimed at reducing foot injuries and providing dry footing, especially around feeders and waterers where cattle congregate. The use of dihydroiodides in the feed or salt is controversial at the present time and there may be toxicity problems associated with their use in cattle. Ensure adequate dietary levels of zinc and other trace minerals.

August

PINKEYE may occur at any time of the year but is most often a problem during summer and autumn. It is caused by the bacterium *Moraxella bovis* and several factors can act to make animals more susceptible. Vitamin A deficiency, dust, wind, lack of pigment in the eyelids and irritation by face flies, which also transmit the disease, have all been implicated. The disease is contagious and can be spread in the winter months among animals confined in close quarters. Recovered animals remain carriers of the disease for periods exceeding one year. This makes elimination of the disease difficult if not impossible.

The lining of the eye is inflamed with excessive tearing. In several days the cornea (surface of the eye) may become clouded or covered with a white plaque. Ulcers may form and in severe cases. The eyeball may become cone-shaped and rupture, resulting in permanent blindness.

When treated early, pinkeye usually responds to antibiotic preparations applied to the eye several times a day. Ointments or lotions are preferable to powders as the latter cause severe irritation to the eye resulting in more tearing which washes the antibiotic away faster. Treatment by a single injection of antibiotics under the eyelid is usually very effective, however, more than one treatment may be required if the eye has become cloudy or ulcerated. Consult with your veterinarian regarding this procedure. Shielding the eye from sunlight, either by confinement indoors or with an eye patch is an important part of treatment. A single patch of denim attached to the upper eyebrow with back tag cement will usually remain long enough to allow the eye to heal.

Control measures include maintaining adequate vitamin A levels and reducing the irritation by face flies by the use of insecticide ear tags or back rubbers containing insecticides mixed with diesel fuel. Vaccines are available for use in preventing pinkeye but they are not effective in all situations.

September

Begin to plan the vaccinations necessary before weaning calves. Preconditioning or preparation of calves for weaning should include vaccination for: blackleg, malignant edema, IBR and PI_3. Consult your veterinarian regarding vaccination against shipping fever.

Plan to wean early, especially if the pasture is poor, to avoid excessive weight loss in the cows. Calves will usually gain faster if they are weaned and put on dry feed. Preconditioning calves should include providing them with dry feed for at least two weeks prior to weaning. Any animals not castrated or dehorned earlier should be done at least three weeks prior to weaning so as to minimize the stress on these animals at weaning.

September is an opportune time to have your breeding females examined for pregnancy by your veterinarian. The results of this pregnancy exam should be recorded and then tabulated according to the animal being open, early pregnant, late pregnant or having abnormalities of the reproductive tract. This grouping allows for analysis of the quality of the breeding program and may point out areas for improvement next year. Early pregnancy examination also allows for earlier culling of open cows or animals with other health problems such as lump jaw, cancer eye, mastitis, and foot problems.

Feed samples should be sent out for analysis as soon as all harvesting is completed in order to have balanced winter rations calculated prior to the start of the winter feeding period.

INFECTIOUS BOVINE RHINOTRACHEITIS (IBR) is a viral infection of the upper respiratory tract affecting the internal tissue of the nose and trachea (windpipe). It is spread by contact with infected animals, usually through coughing and sneezing. Recovered animals may become carriers of the virus and, when exposed to stress later in life, the virus is reactivated and may spread to other animals.

Affected animals are usually over six months of age and show signs including a high fever, harsh cough, nasal discharge, watery eyes, and a loss of appetite. Cattle may become depressed with difficult or labored breathing and dry crusted muzzles. Some animals may develop secondary infections such as pneumonia.

The disease may also cause abortions in pregnant females, severe diarrhea in newborn calves and nervous symptoms in calves under six months of age. There is also a genital form of the disease which causes

inflammation of the penis in bulls and of the vagina in females and results in temporary infertility.

Antibiotics are usually given to control secondary bacterial infections, although they have no effect on the IBR virus.

Vaccination is very effective in preventing the abortion form of the disease but protection against the respiratory form of the disease is variable. There are three types of IBR vaccines available at present in Canada. Consultation with your local veterinarian is important to tailor a vaccination program to suit your particular circumstances. Several recommendations are:

- vaccinate all calves at weaning or preferably at least three weeks earlier
- give replacement heifers a booster shot a month before breeding
- all cows should be vaccinated at least once
- do *not* vaccinate pregnant animals with the "live" intramuscular IBR vaccine

Avoid "topping off" a feedlot pen when there have been cattle resident in the pen for some time. Mixing pens of newly placed cattle is not advised.

PARAINFLUENZA - 3 (PI_3) is regarded primarily as a virus infection that helps to trigger *Pasteurella* pneumonia or shipping fever. In pure viral form, the disease is usually very mild. IBR vaccines usually contain the PI_3 antigen and thus also confer immunity to PI_3.

Discuss the possibility with your veterinarian of vaccinating calves against ITEME.

October

This is the month that calves are usually weaned and the most common disease problem is shipping fever. A better term is bovine respiratory disease, since numerous studies have shown that respiratory disease results from a combination of stress plus viral and bacterial infections usually involving more than one disease-causing organism. Bacteria associated with respiratory disease are *Pasteurella*, *Hemophilus*, *Pseudomonas*, *Corynebacterium*, and others. Viruses involved include IBR, PI_3, BVD, Protoviruses, Reoviruses, and probably many others not yet identified.

Now that the production cycle is completed, producers should determine various herd performance indices in order to judge the efficiency of various management techniques and to predict possible future problems. This can only be accomplished if some sort of record system is used, for example, the Beef Management System available from Alberta Agriculture through your local district agriculturist or veterinarian.

- **Per cent calf crop** is expressed as the number of calves weaned as compared to the number of cows exposed for breeding the previous year.
- **Calving frequency** is shown by counting the number of calves born in successive 20-day periods during the entire calving season.
- **Weaning weights** are used to aid in selection of replacements and to evaluate genetic progress.
- **Calf weight versus dam weight** is expressed as the weight of calf weaned for every 1000 lb (450 kg) body weight of its dam. This gives a measure of production related to the cow's size and can be used as one criterion for culling cows.
- **Number of animals** that were treated and that died in the herd during the year.
- **Cost per pound of calf marketed** is one of the best methods of judging overall production efficiency.

PASTEURELLA PNEUMONIA, sometimes called shipping fever, is still considered to be caused by Pasteurella bacteria. These natural inhabitants of the nasal passages usually cause no harm because they are kept in check by the normal body defence mechanisms. Stress, either physically or by viral infections, lowers the level of natural defences and Pasteurella bacteria multiply rapidly, invade the lungs, and cause a severe pneumonia.

Affected animals are off feed, depressed, have a cough, fever (40-42°C), nasal discharge and rapid and difficult respiration. There may be diarrhea, some degree of bloat, and occasionally knuckling of the fetlocks. The outcome of the disease varies and affected animals may die, suffer from chronic pneumonia, or recover with or without treatment.

Early detection and treatment are essential to minimize the losses associated with Pasteurella pneumonia. Cattle usually respond to most of the common antibiotics given early in the course of the disease provided the dosage of the drugs is adequate. A combination of drugs may be more effective than a single drug but not all drugs can be safely used together. Consult with your veterinarian regarding dosages and combinations of drugs that are recommended. Preventive injections of antibiotics or mass medication through the drinking water may be advised by your veterinarian if more than 10 per cent of a group of animals is affected at one time.

A new *Pasteurella hemolytica* vaccine has been developed in recent years but early experience indicates that in order to get some degree of protection, calves must be vaccinated twice: at least three weeks prior to and again at entry into the feedlot. Vaccination against IBR and PI_3 may also be of value, but prevention and control of Pasteurella pneumonia cannot be achieved without using sound management principles, particularly in regard to avoiding stress. Weaning and moving calves to their final destination, whether to a different pasture or a far away feedlot, should be done with a minimum of excitement. Ideally, calves will have been preconditioned 30 days before weaning, which includes vaccinations, implanting, dehorning, castration, louse and warble treatments, deworming if necessary, identi-

fication by branding or eartags and having calves accustomed to feedbunks and watering devices. Calves thus treated have had time to develop an immune response to vaccinations and at weaning are subjected only to the stress of separation from their mothers.

Calves entering the feedlot should not be put on a high energy ration for the first three weeks after entry, but rather fed a good quality forage with only 10 per cent of the ration as concentrate.

LUMPY JAW is caused by the bacterium *Actinomyces bovis* which invades wounds in the mouth and gums and localizes in the bone of the upper or lower jaw resulting in a painless, hard, bony lump on the affected jaw. It may erupt and discharge a granular pus from several sites. If allowed to progress too far, the lump interferes with eating and chewing. Except for possible early antibiotic therapy in valuable animals, slaughter is the most practical treatment.

Avoid feed containing barley awns and spear grass. Isolate and dispose of animals with discharging lesions because they are sources of infection.

CANCER EYE is a common tumor of the eyelids and eyeballs of cattle. It often grows quite rapidly. Many factors combine to cause the disease and include heredity, nutrition, lack of eyelid pigmentation, sunlight, and viruses. The relative importance of these factors is uncertain.

Some animals recover spontaneously without treatment, but early treatment using various surgical procedures is required to save most animals. Often the condition is well advanced when first noticed. Such animals should be culled. Removal of the entire eye may be of value but often the tumor has invaded deeper tissues and cannot be completely removed.

ATYPICAL INTERSTITIAL PNEUMONIA (AIP) is often seen in the fall, especially when cows are turned on to lush fall pastures or cover crops. Recent studies suggest that high levels of tryptophan in the forage cause the disease, but it has also been associated with other factors which include moldy feed, dusty hay, and lungworm larvae.

The onset of the disease is sudden, often the first animals affected are found dead with no previous signs of illness being noticed. Affected cattle show labored breathing, often with their mouth open, grunting and frothing at the mouth. Attempts to move affected animals often make the condition worse and extreme care is required when working with these animals.

Slaughter of severe cases should be considered before any treatment is started. The disease is usually progressive with a poor response to treatment. Removal of the herd from the affected pasture doesn't appear to have much influence on the number of animals that become ill over the next few days. The use of antibiotics and corticosteroids is often recommended as a therapy.

Because the exact cause is still unknown, prevention of AIP is difficult. Avoid feeding moldy or dusty feeds and observe animals closely for two or three weeks after moving the herd to a new pasture.

BOVINE VIRUS DIARRHEA (BVD) is a highly infectious viral disease which is usually subclinical, meaning clinical signs are usually not detected, but occasionally a severe fatal diarrhea will affect young animals between 6 and 24 months of age. Whether an animal will die of the fatal form of BVD depends on whether it was exposed to a mild form of the virus prior to being born. A fetus exposed to the mild form of the virus before 120 days of gestation may become a carrier of the mild form of the disease; after birth the calf may appear normal until it is exposed to a more severe form of the virus and develops a fatal diarrhea for which there is no treatment. Occasionally, signs of reproductive failure are noted which include abortions, stillbirths, mummified fetl and birth defects.

The fatal form of BVD can only be avoided by preventing the unborn fetus from becoming infected by the mild form of BVD virus. All breeding stock should be vaccinated prior to breeding. The choice of the type of vaccine, as well as the precautions that must be observed, should be discussed with your veterinarian. Two types of vaccines are available for use in preventing BVD. The killed vaccines are safe to use on pregnant animals but require two initial vaccinations three weeks apart followed by annual boosters. Several modified live (MLV) vaccines are available but can only be used on open animals that are kept separate from pregnant animals. Administration of the MLV bovine virus diarrhea vaccines to open heifers after weaning and before breeding time usually confers long-lasting immunity. Annual vaccination is probably not necessary.

November and December

Cattle should be settled into winter quarters by now. Wintering the beef cow is the largest single cost associated with raising the beef calf. Several studies have shown a reduction in calf crop and reproductive performance occurring with an inadequate level of winter nutrition. The feeding program should be designed to bring the breeding females through the winter at the lowest cost while meeting the maintenance and pregnancy requirements of cows and the added need for growth in replacement heifers.

Management techniques which minimize the cost of winter feeding include feed analysis; splitting the herd into groups consisting of mature cows, older or thin cows, and young cows and first-calf heifers; feeding according to weight change; using a short calving season, and early weaning.

Start planning now for spring calving facilities. Watch for abortions and signs of grain overload, bloat and wooden tongue.

GRAIN OVERLOAD generally results from cattle consuming large amounts of grain before changes in the rumen bacterial population have occurred that enable the animal to handle such large amounts. Fermentation of the excess grain occurs rapidly and the rumen contents become very acidic.

In mild cases, animals may be off feed and have a watery diarrhea. Moderate cases may have the appearance of fullness, be weak and staggery, and become dehydrated. Severe cases may be down, comatose, cold, and in a toxic condition which progresses rapidly to death.

Treatment of this condition depends on many factors including the number of animals affected, the amount of grain consumed, the value of the animals and the stage of the disease in which the animals are found. Oral laxatives and antacids are a common treatment, but surgery or emergency slaughter may be indicated, therefore, early consultation with your veterinarian is very important. The key to success in a case of grain overload is early detection with treatment starting as soon as possible.

Ensure adequate bunk space, proper mixing of rations and start feeder cattle on starter rations of *at least* 60 per cent roughage. Avoid bringing cattle onto high grain rations too quickly and prevent accidental access to grain sources.

BLOAT occurs when gas is produced in the rumen faster than the animal can eliminate it. There are two types of bloat: (1) where free gas collects in the upper portion of the rumen, (2) frothy bloat, where gas is trapped in foam in the rumen.

Free gas bloat is usually a result of some functional defect which results in the decreased ability of the animal to burp properly. It may be caused by hardware, liver abscesses, tumors, and obstructions. Treatment usually only involves passing a stomach tube to release the gas from the rumen. Unfortunately, if the cause of the free gas bloat is not determined, gas will again accumulate in the rumen.

Frothy bloat, on the other hand, is of dietary origin including grazing legume forages, finely chopped roughage, and finely ground grain. Fermentation occurring too rapidly results in gas being trapped in the rumen contents as foam, which the animal is unable to eliminate. This results in a rapid accumulation of foam in the rumen.

The onset of bloat, especially frothy bloat, is usually rapid, resulting in a distended abdomen more pronounced on the animal's left side. Affected animals become uneasy and nervous, kick at their belly, have difficult breathing, often with grunting, and may die quickly without prompt treatment.

If the frothy bloat is severe, an emergency rumenotomy must be performed by stabbing a knife into the rumen through the left flank area to release the pressure. A cut of 2 to 3 inches is usually sufficient. This wound should be cleaned up and sutured as soon as possible by your veterinarian. Less severe cases of frothy bloat can be treated medically by administering dioctyl, mineral oil, or detergents into the rumen through a stomach tube. These agents break the foam down and allow normal burping.

Bloat control requires good feed bunk management, and includes avoiding finely ground roughages or grain and adding water to grain to avoid shattering during processing. Feeding poloxalene at the rate of about 20 g per animal per day has been beneficial in preventing pasture bloat but not feedlot bloat (a high grain ration). Adding tallow at the rate of 2-4 per cent of the ration is useful in preventing feedlot bloat. A short-term preventive measure is to incorporate 4 per cent salt into the ration. Avoid bloat producing feeds and pastures.

WOODEN TONGUE aptly describes the swollen, hard, often protruding tongue characteristic of this disease. It is caused by the bacterium *Actinobacillus lignieresi* which may affect other soft tissues of the head and neck. Slobbering and difficulty in eating are indications of this condition which responds well to oxytetracycline given by injection.

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SUMMARY OF VACCINATION PROCEDURES FOR THE CONTROL OF SOME INFECTIOUS DISEASES IN WESTERN CANADIAN BEEF HERDS

DISEASE	TIME TO VACCINATE	REMARKS
IBR/PI_3	At least 3 weeks before weaning or breeding; at entry into a feedlot within 24 hours of arrival	If calves are vaccinated at 2 to 4 months of age, they should receive a booster at 6 to 7 months of age. Do not vaccinate pregnant animals with the modified live intramuscular vaccines.
BLACKLEG (*A. chauveii*) MALIGNANT EDEMA (*Cl. septicum*) INFECTIOUS HEPATITIS (*C. coryi* type B) ENTEROTOXEMIA (*Cl. perfringens* types B,C,D) TETANUS (*C. tetani*) REDWATER (*C. novyi*); type D	All calves over 2 mo. of age with a booster at 4 to 6 mo. of age. 2-way vaccine — blackleg and malignant edema. 7-way vaccine — all listed at the left except Redwater 8-way vaccine — all listed at the left	All beef cattle should be vaccinated for blackleg and malignant edema. The necessity for the other clostridial vaccines depends on the prevalence of each disease in a particular geographical area.
BVD	Replacement heifers after weaning and before breeding if using a modified live vaccine. *OR* All breeding females annually with killed vaccine prior to breeding.	The modified live vaccines must not be used in pregnant animals. Necessity for vaccinating feedlot cattle does not appear high.
VIBRIOSIS	Heifers require two vaccinations at 6 and 3 weeks prior to breeding. Cows require annual booster 3 weeks prior to breeding.	Vaccine does not appear to be of value in breeding bulls.
ITEME	Vaccinate calves 3 weeks prior to weaning and again at weaning.	Booster shot required for protection.
PASTEURELLA	Vaccinate calves 3 weeks prior to weaning and again at weaning.	Booster shot required for protection.
BACTERIAL SCOURS	First-calf heifers require two vaccinations, at least 3 weeks apart, the second 3-6 weeks prior to calving. Cows require an annual booster 3-6 weeks prior to calving.	If management is not optimal, vaccines are of little value.

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